Patent claims

1. A method for treatment of gas exiting the anode side (301) of a solid oxide fuel cell stack (1) fuelled with a carbon containing fuel (100) in a power producing process, characterized in that the anode gas and cathode gas are kept separated by a seal system in the SOFC stack (4) and that the main part of the H_2 and CO in the anode exhaust (351) is separated from the CO_2 in said exhaust (301) by a separation process based on H_2 selective membranes (350).

2. A method according to claim 1, characterized in that the anode exhaust (359) is treated such that most of the CO_2 is not emitted to the atmosphere.

3. A method according to claim 1, characterized in that steam (361) is injected on the permeate side of the hydrogen selective membranes (350).

4. A method according to claim 1, characterized in that the recovered H_2 (355) is fed back to the main SOFC stack (1) and used as fuel.

5. A method according to claim 1, characterized in the recovered H_2 (355) is used to heat the oxygen depleted air (206) entering the expander (207).

6. A method according to claim 1, characterized in that the recovered H_2 (355) is used to heat the air entering the SOFC stack (205).

7. A method according to claim 1, characterized in that the recovered H_2 (355) is exported as a sales product.

8. A method according to claim 1, characterised in that recovered H_2 (355) is fed to the desulphurisation unit (101) to provide necessary hydrogen for hydrodesulphurisation.

9. A method for treatment of gas exiting the anode side (301) of a solid oxide fuel cell stack (1) fuelled with a carbon containing fuel (100) in a power producing process, characterised in that the anode gas and cathode gas are kept separated by a seal system in the SOFC stack (4), that the main part of the H_2 and CO in the anode exhaust (301) is separated from the CO_2 in said exhaust by a separation process based on compressing (312), drying (319) and cooling (321) to a pressure and temperature where most of the CO_2 is in liquid form (322) and subsequently is separated from the H_2 and CO in a conventional gravity based separation process (323).

10. A method according to claim 9, characterised in that the anode exhaust (301) is treated such that most of the CO_2 is not emitted to the atmosphere.

11. A method according to claim 9, characterised in that the recovered H_2 an CO (329) is fed back to the main SOFC stack (1) and used as fuel

12. A method according to claim 9, characterised in that the recovered H_2 an CO (329) is removed in order to avoid build-up of gases which are non-condensable and non-combustible.

13. A method according to claim 9, characterised in that the recovered H_2 an CO (329) is fed to the desulphurisation unit (101) to provide the necessary hydrogen for hydrodesulphurisation.

References

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